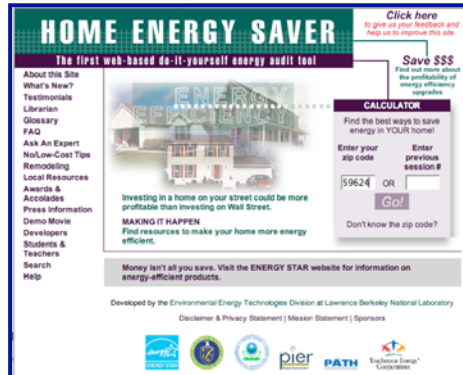


# Update on the Home Energy Saver Do-it-Yourself Audit

<http://HomeEnergySaver.lbl.gov>



Evan Mills, Ph.D.

Lawrence Berkeley National Laboratory

**“The Home Energy Saver is one of the government services that make paying taxes worthwhile.”**

Nick Wilder  
Homeowner  
Wheat Ridge, Colorado

## Mission

- *Empower Users to Reduce Home Energy Use and Greenhouse-Gas Emissions*
- *Offer an Experience Tailored to the Individual User*
- *Serve Diverse User Communities*
- *Define and Remain on Cutting Edge of Technology*
- *Ensure Objectivity, Inclusiveness, Accuracy*
- *Partner with the Private Sector for Deployment*

## Highlights

- First and most technically advanced web-based energy calculator
- Leverages 10's of millions of dollars in federally-funded energy efficiency R&D
- 4.1 million visits to-date (86 million hits)
  - Annualized visitation ~ 1 million/year
  - Users from every state; 91% are homeowners or renters
- Comprehensive algorithms
  - Whole-house scope (and includes interactions)
  - Uses actual electricity tariffs
  - Calculates household greenhouse-gas emissions
- Broad content offerings, in addition to calculations
- 35% of surveyed users say they have implemented energy-efficiency improvements based on results

# Development Team

Founder and Team Leader – Evan Mills  
Production Manager – Rich Brown  
Web Programming & Webmaster – Maggie Pinckard\*  
Heating/Cooling Simulation Programming & Interface – Jeff Warner  
Appliance Data – Peter Biermayer  
Carbon Emissions Factors – Jon Koomey  
Duct Model – Iain Walker  
Energy Education Module – Roland Otto, Mai Sue Chang,\* Eli Marienthal\*  
Fortran Programming – Katie Coughlin, Gregory Homan  
Infiltration Data – Nance Matson  
Miscellaneous Equipment Data – Marla Sanchez\*  
PERL Scripting – Jordan Brinkman,\* Gregory Homan  
SOAP Programming – Chris Bolduc  
Tariff Analysis Project – Katie Coughlin, Chris Bolduc, Richard White\*  
Technical Writer/Editor – Allan Chen  
Utility Tariff Data Collection – Hongjie Qu  
Weather Data – Drury Crawley, Joe Huang, Steve Konopacki\*, Robin Mitchell  
Web Design – Sondra Jarvis  
Web Server Maintenance – Gregory Homan & Maggie Pinckard\*

\* not presently at LBNL

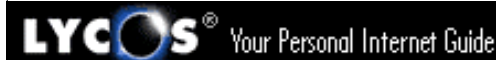
## Sponsors:

DOE – Ed Pollock, Terry Logee, Charles Hemmeline,, John Reese, Lani MacRae, Donna Hawkins  
National Association of Rural Electric Cooperatives  
EPA (past sponsor) – Dale Hoffmeyer, Lena Nirk, Mia South, Steve Offutt  
California Energy Commission (past sponsor) – Martha Brook

# History and Uses

- Founded in 1994 by Evan Mills
- Investment \$2.6M as of 1Q2007 [HES+HIT]
  - includes development, infrastructure, and O&M
- Historic sponsors: DOE, EPA, NRECA, CEC, PATH
- Prime target audience is homeowners and renters
  - Contractors, utilities, students, analysts also use it
- Clearinghouse for DOE research, data, and consumer information (DOE-2, RECS, Energy Star, Standards...)
- Incorporated into *Partnership for Home Energy Efficiency* (DOE, EPA, HUD) – all 3 agencies have standardized on HES (EPA and HUD have chosen to end their work on other detailed tools, in favor of HES) - DOE in lead role at present
- Major new partnership: the National Association of Rural Electric Cooperatives (NRECA) / Touchstone adopted HES as the official calculator for their ~30 million customers

## Awards



## Wall-to-wall media coverage



## Local Papers (32+ states) (partial list)

<b>AR</b> – Searcy Daily Citizen	<b>MA</b> – The Herald News	<b>OR</b> – The Register–Guard
<b>CA</b> – Gilroy Dispatch	<b>MD</b> – Baltimore Sun	<b>PA</b> – The Philadelphia Inquirer
<b>CO</b> – Denver Rocky Mountain News	<b>MN</b> – Minneapolis Star Tribune	<b>SC</b> – The State
<b>DC</b> – Washington Post	<b>MI</b> – Ann Arbor News	<b>TN</b> – Nashville City Paper
<b>DE</b> – The News Journal	<b>MO</b> – St. Louis Post–Dispatch	<b>TX</b> – The Eagle
<b>FL</b> – Miami Herald	<b>MS</b> – Daily Mississippian	<b>UT</b> – Tooele Transcript–Bulletin
<b>GA</b> – Gainesville Times	<b>MT</b> – The Missoulian	<b>VA</b> – Richmond Times–Dispatch
<b>IA</b> – Quad–City Times	<b>NC</b> – NC Indep. Weekly	<b>WA</b> – The Yakima Herald Republic
<b>ID</b> – Boise Weekly	<b>NJ</b> – Bergen Journal	<b>WI</b> – Oshkosh N’western
<b>IL</b> – Chicago Sun Times	<b>NY</b> – The Times Union	
<b>IN</b> – Fort Wayne Journal Gazette	<b>OH</b> – Mount Vernon News	
<b>KY</b> – Courier–Journal	<b>OK</b> – Bartlesville Examiner	

## Energy Companies Linking (partial list)

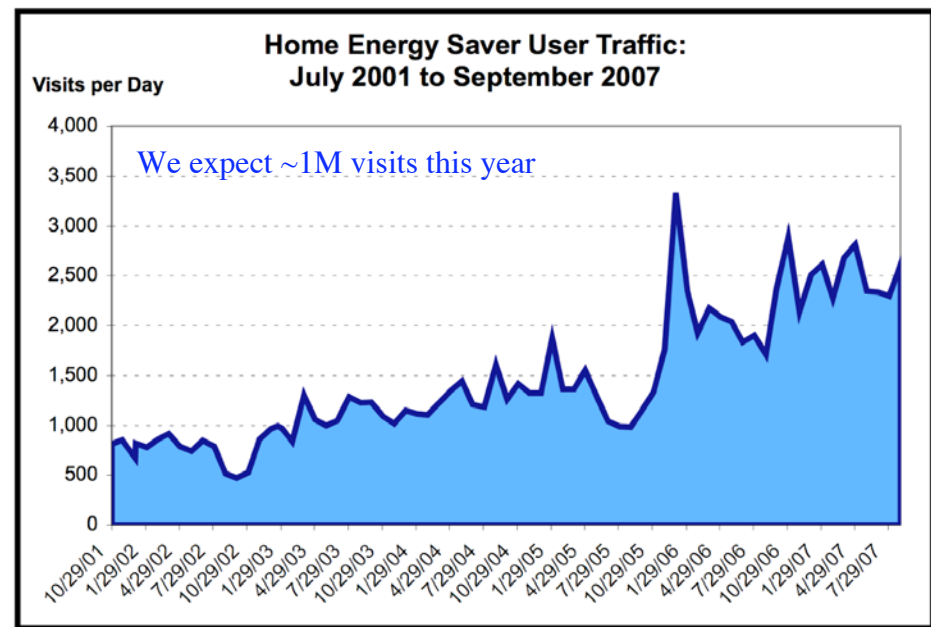
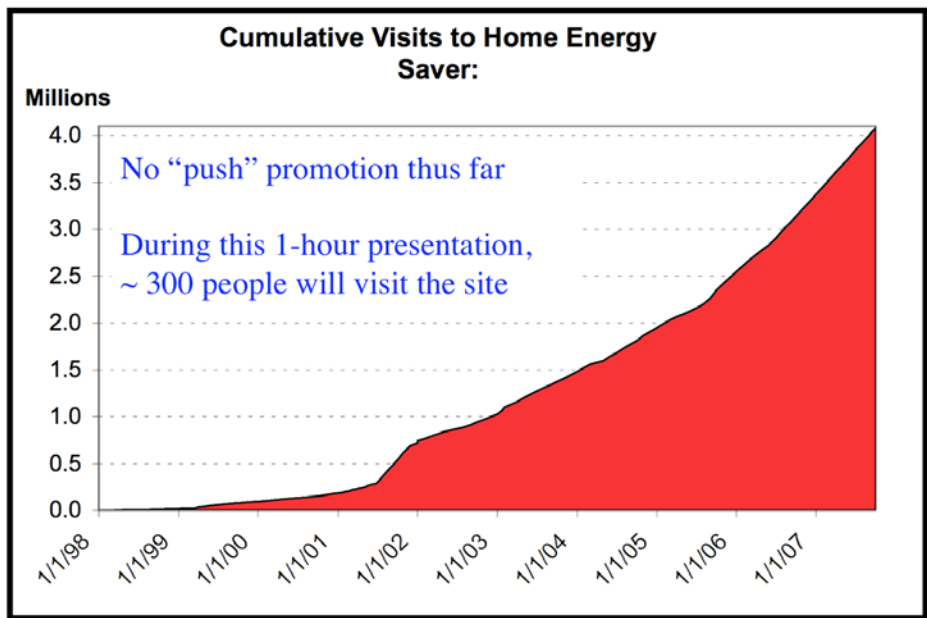
Alameda Power	Consumers Energy (IA)	Nevada Power (NV)
Allegheny Power	Detroit Edison (MI)	PG&E (CA)
Alliant Energy	Dominion Resources / Virginia Power	Pennyrile Rural Electric Cooperative (KY)
<i>American Petroleum Inst.</i>	Douglas Electric Cooperative (OR)	<i>Phillips Petroleum</i>
American Public Power Assoc	Duke Power (NC, SC)	Progress Energy
Bluestem Electric Coop (KS)	United Electric Cooperative, Inc.	Public Service Co. of New Hampshire (NH)
<i>British Petroleum</i>	First Energy	Rochester Public Utilities (NY)
Central Electric Cooperative (PA)	Florida Power and Light	Seattle City Light (WA)
Central Maine Power (ME)	Idaho Power Newsletter (ID)	S. Minnesota Municipal Power Authority (MN)
Central Vermont Public Service Corporation (VT)	Iowa Association of Municipal Utilities	Tallahassee Electric Operations Department (FL)
<i>Columbia Gas (OH)</i>	Moorhead Public Service Co.	Tideland EMC
Commonwealth Edison (IL)	Muscatine Power & Water	Toledo Edison (OH)
Connecticut Light and Power (CT)	National Rural Electrical Cooperative Association	Turlock Irrigation Dist. (CA)

## Example of Utility Link



## High-Visibility on Google™

- Top hit for search strings ...
  - “Energy Audit” (#1)
  - “Energy Survey” (#1)
  - “Save Energy at Home” (#1)
  - “Home Energy Savings” (#1)
- Among Top-10 hits for search strings ...  
(and is listed as a link on many of the other Top-10 pages) ...
  - “Energy Savings” (#4)
  - “Save Energy” (#7)
  - “Save Energy” (#9)
  - “Energy Efficiency” (#9)
  - “Energy Efficient Home” (#10)



## Ultra-low Investment per Visit



Cumulative HES Investment  
(~\$0.50 per visit)

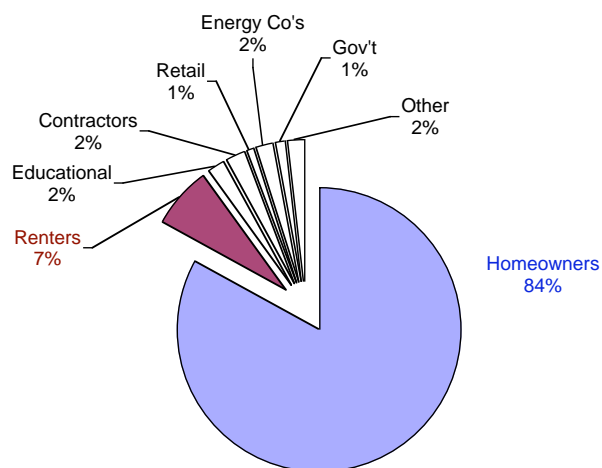


O&M  
(~\$0.10 per visit)

Very cost-effective: O&M cost is  $< 0.3\text{¢/kWh}$  saved ...  
... compared with  $\sim 15\text{ ¢/kWh}$  electricity purchase price  
(assuming only 1% electricity savings for each user)

## Users

(based on 4,900 survey respondents)





## User Feedback

### Ongoing e-survey with 4900 responses thus far

- Users in *every* state (8% CA, 6% TX, 5% NY, 5% FL)
- Return Visits: 18% of users (~50% of non-households)
- Navigation: 87% say “OK” to “very easy”
- Required Input: 83% “Just Right” or “Too Simple”
- Content vs Calculations: Equally important!
- Will Return: 72% “yes”; 21% “undecided”
- Will Recommend: 74% “yes”; 21% “undecided”
- Implemented Efficiency Improvement based on site:
  - 33% (owners); 28% (renters)
    - 70% and 58% of the upgrades were for equipment as opposed to behavior changes

## Log Analysis

(excludes development team, spiders, etc.)

- Median time on site: 19 minutes [minimum info takes ~10 seconds; preliminary “run” ~1 min.]
- Median # of pages viewed per session: 11
- Broad use of the various end-use modules
- Flat content is broadly visited
- 80% of users do “simple” runs; 20% “detailed”
- 89 pages (!) of single-spaced, free-form comments - a very engaged user community

## Walkthrough

### First-tier results require only zip code

**HOME ENERGY SAVER**  
The first web-based do-it-yourself energy audit tool

Click here to give us your feedback and help us to improve this site.

**Save \$\$\$**  
Find out more about the profitability of energy efficiency upgrades

**CALCULATOR**  
Find the best ways to save energy in YOUR home!

Enter your zip code: 59624 OR Enter previous session #

**Go!**

Don't know the zip code?

Investing in a home on your street could be more profitable than investing on Wall Street.

**MAKING IT HAPPEN**  
Find resources to make your home more energy efficient.

Money isn't all you save. Visit the ENERGY STAR website for information on energy-efficient products.

Developed by the Environmental Energy Technologies Division at Lawrence Berkeley National Laboratory

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Logos: Lawrence Berkeley National Laboratory, PATH, and others.

## Second-Tier: input only ~15 questions

**Home Energy Saver Making It Happen**

ABOUT HES What's New Energy Librarian Glossary FAQ Search Help

General Info Heating & Cooling Water Heating Major Appliances Small Appliances Lighting

**Energy Bill for Homes in Helena, Montana**  
Based on the zip code you entered, here is a comparison of the energy costs (in \$/year) of an average home and an energy-efficient home in your area.

Average Home \$1209

Efficient Home \$901

Potential Savings \$408

■ Heating ■ Cooling ■ Water Heating ■ Major Appliances ■ Lighting ■ Small Appliances

See greenhouse gas emissions and energy consumption What should I do next?

**About the Results**

**Save Answers...** You can estimate your energy bill immediately (by pressing the "Save Answers" button), or customize your house description using the links below.

1. Upgrade Calculation:

What simple payback period would you like to use for selecting upgrades? 10 years

What efficiency level would you like to model for the initial selection of upgrades? Energy Star / DOE recommended

(you'll be able to individually adjust the efficiency of each upgrade later)

2. Which city has the most similar climate to your house? Helena

3. Year your house was built: 1959

4. What is the conditioned floor area: 1800 sq. ft.


5. How many stories above ground level are there? 1

6. The front of your house faces: North

7. What type of foundation does your house have? Conditioned Basement

8. How much attic floor or roof insulation do you have? R-11 (4-6 inches)

## User gets second-tier answers rapidly


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[About HES](#)
[What's New](#)
[Energy Librarian](#)
[Glossary](#)
[FAQ](#)
[Search](#)
[Help](#)

Session ID: 702749  
Zipcode: 59605  
Location: Saint Ignace, Montana

### Upgrade Report: Your Energy Bill (\$/year)

Existing Home: \$1581  
with Selected Upgrades: \$750

	Heating	Cooling	Water Heating	Major Appliances	Lighting	Small Appliances
Existing Home	\$ 920	\$ 0	\$ 122	\$ 320	\$ 100	\$ 104
With Selected Upgrades	\$ 325	\$ 0	\$ 51	\$ 204	\$ 60	\$ 104

**Potential Annual Savings**  
Bill: \$831  
Energy: 2,359 kWh & 1,002 Therms  
CO<sub>2</sub> Emissions: 15,152 lb. CO<sub>2</sub>  
[More detail on energy and CO<sub>2</sub>](#)

[Instructions](#) | [Existing Home Configuration: View | Change](#)  
[Return to Initial Results](#)   [View or Modify Upgrade Details](#)

**Detailed Upgrade Report**  
This is a printable report of the upgrades you selected for your home. These upgrades have the potential to save \$831 each year on your utility bill.

**You selected the following upgrades:**

- Install a programmable thermostat
- When replacing your dishwasher, choose an ENERGY STAR-labeled model
- When replacing your electric clothes dryer, switch to natural gas model
- Replace high use incandescent lamps with compact fluorescent lamps
- Insulate basement walls to R-11
- When replacing siding, add external insulating sheathing beneath the siding
- When replacing your windows, choose a double-pane solar-control low-E argon gas wood frame window
- When replacing your gas water heater, choose an energy efficient model
- When replacing your clothes washer, choose an ENERGY STAR-labeled model
- Have a professional seal your home's air leaks
- When replacing your gas furnace, choose an ENERGY STAR-labeled model
- Increase attic floor insulation to R-38
- When replacing your main refrigerator, choose an ENERGY STAR-labeled model

**Upgrade Package Summary:**  
Annual Utility Bill Savings: \$788  
Estimated Package Cost: \$3072  
Maximum Price for 10 year payback: \$7880  
Return on Investment: 19%  
Simple Payback Time: 5 years

## Upgrades ranked by payback time: user can adjust costs & building design


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[Energy Librarian](#)
[Glossary](#)
[FAQ](#)
[Search](#)
[Help](#)

Session ID: 702747  
Zipcode: 59604  
Location: Helena, Montana

### Modify Upgrades: Your Energy Bill (\$/year)

Existing Home: \$1624  
with Selected Upgrades: \$775

	Heating	Cooling	Water Heating	Major Appliances	Lighting	Small Appliances
Existing Home	\$ 940	\$ 0	\$ 148	\$ 320	\$ 100	\$ 104
With Selected Upgrades	\$ 327	\$ 0	\$ 77	\$ 201	\$ 60	\$ 104

**Potential Annual Savings**  
Bill: \$849  
Energy: 2,359 kWh & 1,033 Therms  
CO<sub>2</sub> Emissions: 15,514 lb. CO<sub>2</sub>  
[More detail on energy and CO<sub>2</sub>](#)


[Instructions](#) | [Existing Home Configuration: View | Change](#)  
[Recalculate Package Totals](#)   [Return to Initial Results](#)   [View Upgrade Report](#)

Add'l Savings	Upgrade	Upgrade Choice and Description	Bill Savings Compared to Existing Unit		Estimated Cost	Max. Cost for 10 Year Payback	Simple Payback Time	Estimated Return on Investment
			Existing Unit	New Unit				
Total for Selected Upgrades:			\$849	\$807	\$3,970	\$8,070	5	20%
<input type="checkbox"/>	Thermostat	ENERGY STAR-labeled programmable	\$52	\$52	Typical Costs \$70	\$520	1	74%
<input checked="" type="checkbox"/>	Electric clothes dryer	Switch to gas dryer	\$55	\$55	Typical Costs \$50	\$550	1	110%
<input checked="" type="checkbox"/>	Indoor lights	CFLs in high-use fixtures	\$60	\$60	Typical Costs \$58	\$600	2	56%
<input checked="" type="checkbox"/>	Basement wall insulation	R-11	\$157	\$157	Typical Costs \$113	\$1,570	3	31%
<input checked="" type="checkbox"/>	Dishwasher	EF=0.58 (ENERGY STAR)	\$20	\$10	Typical Costs \$30	\$100	3	33%
<input checked="" type="checkbox"/>	Windows	Units 2-pane/solar-control low-E/argon gas/wood (ENERGY STAR)	\$131	\$131	Typical Costs \$555	\$1,310	4	24%
<input checked="" type="checkbox"/>	Wall insulation	Units R-11 wall + R-5 exterior foam sheathing	\$122	\$122	Typical Costs \$575	\$1,220	5	21%
<input checked="" type="checkbox"/>	Gas water heater	Units EF=0.62	\$27	\$27	Typical Costs \$130	\$270	5	19%
<input checked="" type="checkbox"/>	Clothes washer	Units MEF=1.42 WF=9.5 (ENERGY STAR)	\$71	\$44	Typical Costs \$210	\$440	5	10%
<input checked="" type="checkbox"/>	Air sealing	25% air leakage reduction	\$70	\$70	Typical Costs \$400	\$700	6	17%

## “Retrofit Report” x measure (excerpt for programmable thermostat)

Install a programmable thermostat	
<b>Economic Benefits</b> <a href="#">Estimated Annual Bill Savings: \$52</a> <a href="#">Estimated Lifetime Energy Cost Savings: \$780</a> <a href="#">Upgrade Cost: \$70</a> <a href="#">Return on Investment: 74%</a> <a href="#">Upgrade pays for itself in: 1 year</a>	
<b>Additional Benefits:</b> Programmable thermostats can help keep your home more comfortable.	
<b>Upgrade Description:</b> Install an ENERGY STAR®-labeled programmable thermostat, and program it to change the temperature settings when you are away from home and at night. EPA estimates that ENERGY STAR-labeled programmable thermostats can save consumers 10-15% on heating and cooling bills when used properly. Note: Our calculations (bill savings and cost-effectiveness) assume that the heating-season set-point is decreased 4° F during the day (9 am to 5 pm) and at night (11 am to 7 pm), while the cooling-season set-point is increased 3° F during those same periods. Larger set-point adjustments can provide additional bill savings.	
<b>Purchasing Tips:</b> <ul style="list-style-type: none"> <li>Some programmable thermostats have a “smart” feature designed to maximize energy savings. These thermostats continually monitor usage patterns in order to determine the best time to turn the system on in order to reach the desired temperature setting, while minimizing energy use.</li> </ul>	
<b>More Information</b> <ul style="list-style-type: none"> <li><a href="#">ENERGY STAR thermostat product list</a></li> <li><a href="#">General Information</a></li> </ul>	

## Drill-down Results: Energy, \$, and CO<sub>2</sub>

 <b>Home Energy Saver Making It Happen</b> <small>About HES What's New Energy Librarian Glossary FAQ Search E-mail Help</small>				
Detail of Whole House Annual Energy Use				
		Your House	With Selected Upgrades	Savings
Whole House	\$	\$1,624	\$775	\$849
	Energy	6,399 kWh & 1,865 Therms	4,039 kWh & 832 Therms	2,359 kWh & 1,033 Therms
	Emissions	31,133 lb. CO <sub>2</sub>	15,619 lb. CO <sub>2</sub>	15,514 lb. CO <sub>2</sub>
<hr/>				
Heating	\$	\$940	\$327	\$613
	Energy	528 kWh & 1,491 Therms	352 kWh & 496 Therms	176 kWh & 995 Therms
	Emissions	18,190 lb. CO <sub>2</sub>	6,309 lb. CO <sub>2</sub>	11,882 lb. CO <sub>2</sub>
Cooling	\$	\$8	\$8	\$0
	Energy	75 kWh	75 kWh	0 kWh
	Emissions	110 lb. CO <sub>2</sub>	110 lb. CO <sub>2</sub>	0 lb. CO <sub>2</sub>
Hot Water	\$	\$148	\$77	\$71
	Energy	374 Therms	256 Therms	118 Therms
	Emissions	4,369 lb. CO <sub>2</sub>	2,991 lb. CO <sub>2</sub>	1,379 lb. CO <sub>2</sub>
Major Appliances	\$	\$326	\$201	\$125
	Energy	3,178 kWh	1,509 kWh & 80 Therms	1,669 kWh & (80) Therms
	Emissions	4,641 lb. CO <sub>2</sub>	3,137 lb. CO <sub>2</sub>	1,503 lb. CO <sub>2</sub>
Lighting	\$	\$100	\$60	\$40
	Energy	1,288 kWh	772 kWh	514 kWh
	Emissions	1,878 lb. CO <sub>2</sub>	1,127 lb. CO <sub>2</sub>	751 lb. CO <sub>2</sub>
Misc.	\$	\$104	\$104	\$0
	Energy	1,332 kWh	1,332 kWh	0 kWh
	Emissions	1,945 lb. CO <sub>2</sub>	1,945 lb. CO <sub>2</sub>	0 lb. CO <sub>2</sub>

## Additional “drill-down” results

**Home Energy Saver Making It Happen**  
About HES What's New Energy Librarian Glossary FAQ Search E-mail Help

**Appliance and Water Heating Consumption** Here is the approximate energy consumed in a typical year, by your major appliances.

Appliance	Appliance Energy		Water Heating Energy			Total Energy	Total Cost
	Energy per Year	Cost per Year	Water Use (gal/day)	Energy per Year	Cost per Year		
First Refrigerator:	858 kWh	\$ 67	none	none	none	858 kWh	\$ 67
Stove:	365 kWh	\$ 28	none	none	none	365 kWh	\$ 28
Oven:	239 kWh	\$ 19	none	none	none	239 kWh	\$ 19
Clothes Dryer:	1456 kWh	\$ 114	none	none	none	1456 kWh	\$ 114
Clotheswasher	98 kWh	\$ 8	21	101 therms	\$ 61	98 kWh & 101 therms	\$ 69
Dishwasher Total	162 kWh	\$ 13	6	29 therms	\$ 17	162 kWh & 29 therms	\$ 30
Hot Water: Taps and Faucets	none	none	51	245 therms	\$ 148	245 therms	\$ 148
<b>Totals</b>	<b>3178 kWh</b>	<b>\$ 248</b>	<b>78 gallons</b>	<b>374 therms</b>	<b>\$ 226</b>	<b>3178 kWh &amp; 374 therms</b>	<b>\$ 474</b>

Appliance energy is the energy used by motors, heating elements, and burners inside your appliances. This number excludes the energy consumed by your water heater to supply hot water for appliances such as clothes washers and dishwashers.

[What if my results don't match my energy bill?](#)

## Third Tier: Home can be defined in great detail, if user wishes (inputs optional)

**The Non-Rectangular House Page** Save Answers

**Backward S-shape**

Since the house is not a rectangle, please enter the dimensions needed to estimate the energy consumption of the house.

The diagram shows a backward S-shaped house with the following dimensions and labels:

- Top horizontal side: "This side faces the street"
- Right vertical side (top): "Length of this side: 10"
- Inner horizontal side (top): "Length of this side: 10"
- Left vertical side (top): "Length of this entire side: 32.86"
- Inner horizontal side (middle): "Length of this side: 10"
- Right vertical side (middle): "Length of this side: 10"
- Inner horizontal side (bottom): "Length of this side: 10"
- Left vertical side (bottom): "Length of this entire side: 54.77"
- Bottom horizontal side: "This side faces the street"

Walls

Save Answers

1. Please select the [construction type](#), [insulation level](#), and [exterior finish](#) of your house's walls

Insulation Level	Exterior Finish					
	Wood Siding	Stucco	Vinyl Siding	Aluminum Siding	Brick Veneer	None
R-0 (no insulation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-3 (1-2 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-7 (2-3 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-11 (3-5 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-13 (5-6 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-15 (6-7 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-19 (7-9 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-21 (9-10 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Wood Frame					
R-11 (3-5 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-13 (5-6 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-15 (6-7 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-19 (7-9 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-21 (9-10 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

With Insulated Headers					
R-11 (3-5 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-13 (5-6 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-15 (6-7 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-19 (7-9 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-21 (9-10 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

With EPS Sheathing					
R-11 (3-5 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-13 (5-6 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-15 (6-7 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-19 (7-9 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-21 (9-10 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

With Insulated Headers and EPS Sheathing					
R-11 (3-5 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-13 (5-6 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-15 (6-7 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-19 (7-9 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-21 (9-10 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

With EPS Sheathing and OVE					
R-19 (7-9 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-21 (9-10 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

With OVE					
R-19 (7-9 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-21 (9-10 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-27 (10-12 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-33 (12-15 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
R-38 (15-16 inches)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Structural Brick	
R-0 (no insulation)	<input type="radio"/>
R-5 (1 inch)	<input type="radio"/>
R-10 (2 inches)	<input type="radio"/>

Concrete Block	
R-0 (no insulation)	<input type="radio"/>
R-3 (1/2 inch)	<input type="radio"/>
R-6 (1 inch)	<input type="radio"/>

Straw Bale	
R-0 (no insulation)	<input type="radio"/>

## Many wall construction options

Lighting

☐ **Option 1:** Based on the information you supply about the number of lighting fixtures, we can estimate the energy used by lights. This estimate will be based on typical hours of use and wattage from a field study that monitored lighting in homes.

☐ **Option 2:** If you prefer, you can provide the exact wattage and average hours of use per day for each fixture. This information will then be used to calculate lighting energy use. It will probably take you a few minutes to collect the wattage for each fixture.

Save answers...

How many light fixtures do you have in the following rooms (include portable (plug-in) lamps): Note: Multiple lights on a single circuit (switch) count as one fixture.

Kitchen	2	Dining Room	1	Living Room	3
Family Room	1	Master Bedroom	2	Hall	2
Bedroom(s) (enter the total for all other bedrooms, excluding closet lights)	2	Bathroom(s) (enter the total for all bathrooms)	2	Closet(s) (enter the total for all closets)	0
Utility Room	0	Garage	1	Outdoor Lighting	2
Other	0				

## Lighting: two levels of detail

## Extensive coverage of “misc.” uses

**Home Office** [Save Answers](#)

**Please enter detail if you own the following appliances**  
Whenever there is more than one of a particular item, enter the average per-unit usage for all units in the house.  
[Do not select more than 24 hours in a day](#)

Computer CPU  used   per

Computer Monitor  used   per

Laptop Computer Charger  used   per  (Time should indicate time that laptop is plugged into the charger)

Laser Printer  used   per  (Time should indicate time printer is actively printing)

Inkjet Printer  used   per  (Time should indicate time printer is actively printing).  
All inkjet printers naturally qualify as EnergyStar, therefore there is no difference in the energy used by EnergyStar vs. non-EnergyStar inkjet printers.

Router / DSL / Cable Modem  used   per

Thermal Fax Machine  used   per  Energy Star? ☐ Yes ☒ No

Inkjet Fax Machine  used   per

Home Copy Machine  machine

Time Copying   per

Time Left On but Idle   per


## Unique tariff module [~300 utilities] (Tariff database funded by BT-Standards)


**Home Energy Saver Making It Happen**

[About HES](#) [What's New](#) [Energy Librarian](#) [Glossary](#) [FAQ](#) [Search](#) [Help](#)

[General Info](#) [Heating & Cooling](#) [Water Heating](#) [Major Appliances](#) [Small Appliances](#) [Lighting](#)

**Energy Bill for Houses in Berkeley, California**  
Based on the zip code you entered, here is a comparison of the energy costs (in \$/year) of an average home and an energy-efficient home in your area.

Average House - \$1206  Potential Savings \$395

Efficient House - \$811 

■ Heating ■ Cooling ■ Water Heating ■ Major Appliances ■ Lighting ■ Small Appliances

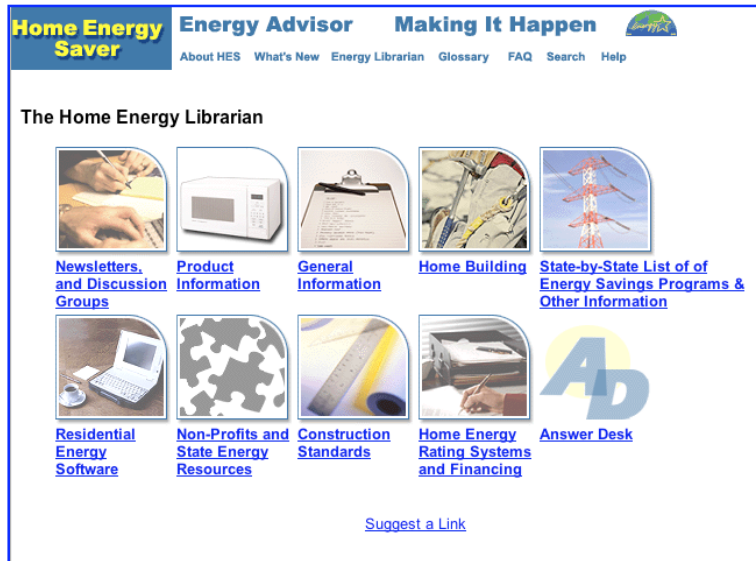
[See greenhouse gas emissions and energy consumption](#) [What should I do next?](#)

Select your utility from the list below

- ☐ Alameda City of [Read more information](#)
- ☐ Anaheim City of [Read more information](#)
- ☐ Imperial Irrigation District [Read more information](#)
- ☐ Los Angeles City of [Read more information](#)
- ☐ Modesto Irrigation District [Read more information](#)
- ☐ Pacific Gas & Electric Co [Read more information](#)
- ☐ Redding City of [Read more information](#)
- ☐ Riverside City of [Read more information](#)
- ☐ Sacramento Municipal Util Dist [Read more information](#)
- ☐ San Diego Gas & Electric Co [Read more information](#)
- ☐ Southern California Edison Co [Read more information](#)
- ☐ Southern California Water Co [Read more information](#)
- ☐ Turlock Irrigation District [Read more information](#)

[Choose this Utility](#)

## Calc's complemented with extensive decision-support content



## Recent Technical Improvements

- About 35 new weather locations for simulation; more tariffs to choose from
- Many new floor, wall, ceiling, and roof construction types/insulation levels
  - Variability of wall construction type on different sides of house
- Many new roof pitches
  - Option of specifying roof absorptance
- Many new window, skylight, and door types
  - Option of specifying window, skylight, and door properties
- Option of specifying measured house air leakage rate
- Distinction between thermostat-controlled and on/off room air conditioners
- DOE-2 duct efficiency function
  - Based on residential standard methodology developed by ASHRAE
  - Considers duct location, insulation level, and application of sealant
  - Recalculates hourly delivery efficiency of duct distribution system